HACCP IN YOUR SCHOOL

HAZARD ANALYSIS CRITICAL CONTROL POINTS

HACCP IN YOUR SCHOOL

Hazard Analysis Critical Control Points (HACCP) is a food safety plan designed to prevent foodborne illness at your school. The U.S. Department of Agriculture (USDA) requires that all schools have a HACCP plan in place beginning July 2006.

There are two binders in your school that outline your school's HACCP Plan. One binder contains a menu summary and copies of your recipes. The second contains the HACCP plan, which includes safety and sanitation standards and the records that you must complete.

Why HACCP?

Foodborne illness is more common than most people realize. About 48 million people get sick each year with foodborne illness in the United States. That is about one in every six Americans. Improper hygiene practices or eating contaminated food or drink is what causes most cases of foodborne illness. Although any food can become contaminated, time/temperature control for safety (TCS) foods are of concern because they are low acid, moist, and contain some protein. To prevent foodborne illness you must handle TCS and non-TCS foods safely.

It is also important to remember that anybody can get sick if they eat contaminated food, but some people are more susceptible than others. Infants, preschool age children, pregnant women, older adults, and the immunocompromised are more likely to become ill if exposed. They are more likely to develop complications or end up in the hospital.

The good news is that you can reduce the likelihood of foodborne illness by handling food safely from the time it is received until the time it is served.

Knowledge about safe food handling does not prevent foodborne illness; **applying safe handling practices** does.

The Safe Food Handler

The first step in preventing foodborne illness is to use good hygiene practices when you are at work. Harmful microorganisms that cause foodborne illness might be on your skin. Therefore, bathe or shower before coming to work each day and... keep your hair clean and properly covered, keep fingernails clean and cut short. How you dress also plays an important role in preventing foodborne illness. Dirty clothes can be a source of harmful microorganisms.

Therefore, be sure to:

- Wear a clean hat or other hair restraint–this will keep you from touching your hair as well as keep your hair from falling into food.
- Wear clean clothing–if you can, put your work clothes on when you arrive at work.
- Remove your apron whenever you leave the kitchen–take off your apron and properly store it before taking out the garbage or using the restroom.
- Remove all jewelry while working–the only exception is that you can wear a plain wedding band.

Proper glove use

Gloves can help keep food safe by preventing contact between your hands and food. However, if gloves are not properly used, the gloves themselves could contaminate food. Contamination is making something unclean or unsafe through improper handling.

Therefore, when wearing gloves:

- Wash your hands before putting them on and before changing to a fresh pair.
- Never wash and reuse them–only use them one time.
- Never wear gloves when handling money.
- Change them often.

  –When they become dirty or torn

  –After handling raw food

  –At least every four hours during continual use

Hands

Hands, like gloves and dirty clothes, can also contaminate food. To prevent this:

- Keep fingernails clean and cut short–long fingernails are more difficult to keep clean.
- Do not wear nail polish–it can hide dirt under nails and might flake off into food.
- Do not wear false nails–they are difficult to keep clean and can break off into food.
- Cover cuts and sores on hands with a bandage–always wear a glove to keep the bandage dry and prevent it from falling into food.

Washing your hands frequently and properly will also prevent contamination.

To wash hands properly:

- Wet hands with warm water at a handsink.
- Apply handsoap.
- Scrub for at least 10-15 seconds, while cleaning under fingernails and between fingers.
- Rinse thoroughly under warm running water.
- Dry with a single-use paper towel or warm-air hand dryer.
- Use the paper towel to turn off the water faucet and to open the bathroom door when returning to work.

The whole process should take at least **20 seconds**.

Always wash hands after:

- Using the restroom.
- Handling raw meat, fish, or poultry (before and after).
- Touching your hair, face, body, clothing or apron.
- Sneezing, coughing, or using a tissue.
- Smoking, eating, drinking, or chewing gum or tobacco.
- Handling cleaning supplies and chemicals.
- Handling dirty dishes or taking out garbage.
- Touching anything else that might contaminate hands, such as unsanitized equipment, work surfaces, or washcloths.

Remember–hand sanitizers are not a replacement for effective and proper hand washing.

When you get sick

Never handle food when you are sick because you could contaminate food and make others sick. This is especially critical if you have been diagnosed with a foodborne illness. Never work with food if you have a foodborne illness.

Also, tell your manager if you are sick or are not feeling well. And…always let your manager know if you have:

- Diarrhea
- Vomiting
- Sore throat with fever
- Jaundice (yellowing of the skin and eyes)
- Infected cuts or wounds, or lesions containing pus on the hand, wrist, and exposed body part (*such as boils and infected wounds, however small*)

Note: Diarrhea and vomiting from *noninfectious* conditions do not apply to this policy.

You should also notify the manager whenever diagnosed by a healthcare provider as being ill with any of the following diseases that can be transmitted through food or person-to-person by casual contact such as:

- Salmonellosis
- Shigellosis
- *Escherichia coli*
- Hepatitis A virus, or
- Norovirus

In addition to the above conditions, notify the manager if you have been exposed to the following high-risk conditions:

- Exposure to or suspicion of causing any confirmed outbreak involving the above illnesses.
- A member of your household is diagnosed with any of the above illnesses.
- A member of your household is attending or working in a setting that is experiencing a confirmed outbreak of the above illnesses.

If you become sick at work, your manager might ask you to stop working around food or equipment.

Remember–sick workers can contaminate food and make others sick.

APPLICATION EXERCISES

Can They Handle It?

Directions: For each situation, should the worker be working?

Yes	**No**	Sue has developed a sore throat with fever since coming to work.
Yes	**No**	Cindy has itchy eyes and a runny nose.
Yes	**No**	Tom vomited several times before coming to work.
Yes	**No**	Juanita has had a sore throat for several days but still came to work today.
Yes	**No**	Rhonda has made several trips to the bathroom because she has diarrhea.
Yes	**No**	Paul has been coughing all morning.

What Did Karen Do Wrong?

Directions: Karen is washing her hands after handling raw chicken. Mark an "X" next to each step that Karen did *not* properly follow.

_____ Karen wets her hands with warm running water at the produce sink.

_____ Karen puts dish detergent on her hands and lathers up.

_____ Karen scrubs her hands for 20 seconds.

_____ Karen rinses them thoroughly under running water.

_____ Karen dries her hands using a paper towel.

For each step that Karen did not properly follow, what should she have done?

_____

_____

_____

_____

_____

Check Their Hands

Directions: What must each of the following workers do before they begin handling food?

Maria–she has polished nails.

_____

Janine–she has long nails.

_____

Samantha–she has short nails.

_____

Bob–he has a sore on the top of his hand.

_____

What Did Sue Do Right?

Directions: Before going to work, Sue took a shower, trimmed her fingernails, and put on a fresh coat of nail polish. She then put on her bracelet, a watch, and her clean clothes and went to work. What did Sue do right and what did she do wrong?

RIGHT	WRONG
_____	_____
_____	_____
_____	_____
_____	_____

APPLICATION EXERCISES

Test Your Knowledge–True or False

T	**F**	Jewelry should not be worn when handling food.
T	**F**	Nail polish and false fingernails can be worn when handling food if single-use gloves are worn.
T	**F**	Bathe or shower before coming to work each day.
T	**F**	After washing your hands, rinse them under cool water.
T	**F**	You can contaminate food if you touch it after sneezing into your hands.
T	**F**	Wash your hands each time you touch your face or hair.
T	**F**	A dirty apron could be a source of harmful microorganisms.

Notes

Purchasing and Receiving

All food that is used in your school kitchen must be from a safe and approved source. Safe and approved sources are suppliers that meet pertinent laws and regulations.

Inspect all food deliveries before putting them in storage. Use the criteria that is in 2-5: Safe Food Handling of your HACCP binder to determine if foods that are delivered will be accepted or rejected.

Criteria for Accepting or Rejecting a Food Delivery

Food	Criteria to Accept Delivery
Raw meat and poultry	• 41°F or colder • Stamped with USDA inspection stamp • Good reddish-pink color or no odor • Packaging clean and in good condition and no signs of tampering or leaking
Raw seafood	• 41°F or colder • Good color and no off-odors (ammonia odor) • Flesh is firm and shiny with no brownish or yellowish discolorations • Skin and flesh are moist but do not have a slimy feel • Packaging clean and in good condition and no signs of tampering • Packed under Federal Inspection seal is present
Fresh produce	• Clean and good condition and no signs of tampering • If produce is cut or processed, it must be at 41°F or colder
Dairy products	• 41°F or colder • Packaging clean and in good condition and no signs of tampering • All products are pasteurized
Eggs	• Shell eggs at 45°F or colder; liquid eggs at 41°F or colder • Clean and uncracked • Packaging clean and in good condition and no signs of tampering
Refrigerated and frozen processed food	• 41°F or colder; if frozen, the product is rock solid • Packaging clean and in good condition and no signs of tampering or thaw/refreeze

Criteria for Accepting or Rejecting a Food Delivery, continued

Food	Criteria to Accept Delivery
Foods in reduced oxygen packaging	• If the product requires refrigeration, it is at 41°F or colder • Packaging clean and in good condition and no signs of reduced oxygen packaging tampering • Labels can be read and attached to the product
Canned foods	• Container clean and in good condition and no signs of tampering • Label intact • No rust or corrosion of the can • No bulges • If there are dents, the dents are not sharp and are not on a seam
Dry foods	• Packaging clean and in good condition and no signs of tampering • No signs of pest infestation
Ultra-high temperature pasteurized foods (UHT)	• Packaging clean and in good condition and no signs of tampering • If product requires refrigeration, it is at 41°F or colder • Label is attached and can be read
Baked goods	• Packaging clean and in good condition and no signs of tampering • Products are not moldy

APPLICATION EXERCISES

Accept or Reject

Directions: Mark with a "✔" which of the following foods should be accepted and with an "**X**" if the food should be rejected.

_____ Ten pound package of ground beef that is gray in color

_____ Two cartons of shell eggs that are at 50°F

_____ Twenty-five pound bag of flour with a small tear in the bottom corner

_____ Case of canned corn, one can is slightly dented but the dent is not on the seam

_____ Two, one-gallon containers of milk that have a sell-by date of yesterday

_____ Frozen pizzas that have thawed completely

_____ Packaged lettuce that is in a clean, labeled bag

Test Your Knowledge–True or False

T **F** Shell eggs that are at 45°F are safe to accept.

T **F** You can accept dented cans as long as the dent is only on the seam.

T **F** Meat that is brown in color is okay to accept because it will be cooked.

T **F** Check the temperature of every carton of milk before putting into storage.

T **F** If a frozen food is rock hard, it can be put in the freezer.

T **F** Watermarks on a container of frozen food is a sign of temperature-abuse.

Notes

Storage

When food is not properly stored or it is not used in a timely manner, it could become unsafe to eat. Unsafe storage temperatures also create conditions that allow harmful bacteria to grow. Unsafe storage practices could make food unsafe to eat.

Safe storage guidelines

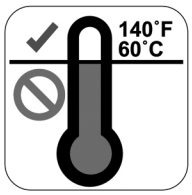
- Do not remove the labels from commercially processed food. If removed, label the container with the name of the contents.
- Date everything, except produce, when it is received with month and year; fresh produce should be dated with month and day.
- Rotate products to ensure that the oldest food is used first–first in, first out.
- Throw out food that is past dated.
- Store food in designated areas away from walls and at least six inches above the floor.
- Keep all storage areas clean, dry, well ventilated, and at the proper temperatures.
- Clean all storage areas on a regular basis.

Frozen storage

- Place a freezer thermometer near the front of the freezer.
- Keep the temperature at 0°F or colder and check temperature daily.
- Place frozen food deliveries in the freezer as soon as they have been inspected.
- Store away from walls and at least six inches above the floor.
- Do not overload freezers and store food to allow for good air circulation.
- Do not put large quantities of foods in freezer to cool. Some schools use freezers to cool small quantities of leftovers.
- If necessary, defrost freezers regularly.
- Keep the freezer closed as much as possible.

Refrigerated storage

- Place a refrigerator thermometer on the top shelf near the door.
- Keep temperature at 39°F or colder and check each day.
- Do not line shelves with foil or other materials because this prevents air circulation.
- Store food to allow for good air circulation.
- Store food away from walls and at least six inches above the floor.
- Store raw foods below cooked or ready-to-eat foods.
- Do not put large volumes of hot food into the refrigerator to cool.
- Cover food properly to prevent cross-contamination.



Hot-holding cabinets

- Place a thermometer on the top shelf near the front of the unit.
- Set temperature at 140°F or hotter and check before putting the first pan of food into the cabinet.

Dry storage

- Set temperature between 50°F and 70°F and check once per month.
- If possible, maintain humidity levels between 60% and 70%.
- Store dry food away from walls and at least six inches above the floor.
- Keep dry food out of direct sunlight.
- Store food in durable containers that cannot be damaged by water or pests.

Chemical storage

- Store cleaning supplies and other chemicals away from all food, dishes, utensils, linens, and single-use items and at least six inches above the floor.
- Keep cleaning supplies and chemicals in their original containers.
- If cleaning supplies and chemicals are not in their original containers, clearly label the side of the holding container with the name of the contents. Do not label the lid because lids are interchangeable.
- Keep Material Safety Data Sheets (MSDS) in the chemical storage area. It is recommended to highlight the name of the chemical and first aid procedures for quick reference in an emergency.

First In, First Out (FIFO)

Past-dated food will lose its quality and sometimes become unsafe over time. First in, first out (FIFO) is one way to prevent this. When foods are received, put the oldest in the front and the newest in the back. Throw out foods that are past-dated.

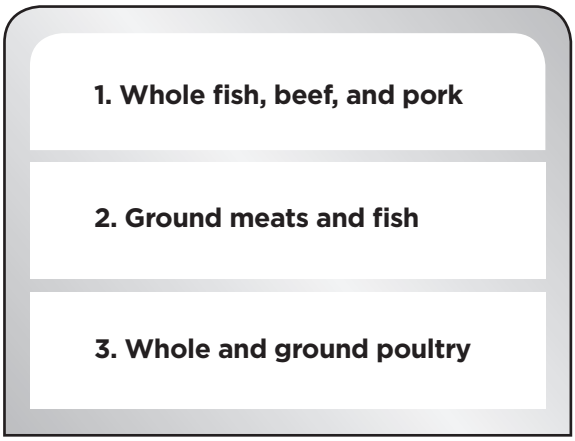
Preventing cross-contamination during storage

When harmful microorganisms are transferred from one thing to another, cross-contamination has occurred. If you are not careful, it can happen very easily during storage. For example, cross-contamination can take place when raw food (like chicken) touches or drips onto a ready-to-eat food (like lettuce). Or, it can happen when food is stored in a container that has not been properly cleaned and sanitized.

To prevent cross-contamination during storage:

- **Store food in designated storage areas**–keep food away from dishwashing areas, garbage rooms, and furnace rooms. Never store food near chemicals or cleaning supplies, and keep it out from under stairways and pipes.
- **Store food in cleaned and sanitized food-grade containers**–cover with tight-fitting lids, plastic wrap or aluminum and label the new container with the name of the food, amount of food, and the date to be used.
- **Store raw meat, fish and poultry separately from prepared and ready-to-eat food**–if these items cannot be stored separately, store raw foods below prepared or ready-to-eat food.

Store raw meat, fish, and poultry in the following top to bottom order in the refrigerator:



Storage Temperature for Select Foods

Food	Temperature	Other Requirements
Raw meat	**41°F**	• Tightly wrap or place it in a deep container
Raw poultry	**41°F**	• Store ice-packed poultry in self-draining containers • Change ice often and sanitize the container regularly
Raw fish	**41°F**	• Tightly wrap or store in original packaging
Shell eggs	**41°F**	• Use within four weeks of the packing date
Dairy	**41°F**	• Discard if past the use-by or expiration date
Frozen dairy products	**6-10°F**	• Discard if past the use-by or expiration date
Fresh produce	**Varies**	• Store in clean container
Cut produce	**41°F**	• If delivered packed on ice, store that way
Reduced oxygen packaged (ROP) foods	**41°F**	• Discard if past the use use-by or expiration date
UHT foods	**50-70°F**	• Once opened, store at 41°F or colder • Read the label to determine if the product needs to be refrigerated
Canned/dry food	**50-70°F**	• If removed from its original packaging, store in airtight clearly labeled containers

Date marking

One common cause of foodborne illness is preparing food too far in advance of service. Many schools prepare foods in advance because it is economical. These foods are called pre-prepared foods. Many schools also save leftovers, some that must be properly cooled. Pre-prepared foods can be frozen for up to four weeks and leftovers can be frozen or refrigerated for up to three days, so it is important to know which is which.

1. **Pre-prepared foods**–menu items (or menu ingredients) prepared in advance for future service beyond a specific meal. These are foods that are made in-house and then frozen for up to four weeks. This does *not* include commercially processed pre-prepared foods, such as Hot Pockets or frozen pizza. Follow the manufacturer guidelines for the storage time of commercially processed foods.

   Examples of pre-prepared foods include cooked ground beef, spaghetti sauce, chili, and bread that have not been held for service.

2. **Leftovers**–menu items (or menu ingredients) that are prepared in-house for a specific day's service and that are not served. Leftovers also include opened containers or packages of commercially processed, ready-to-eat foods, such as potato salad, tuna salad, or deli meats. These foods must also be used within three days from the date the package is opened *or* used by the date stamped on the package, whichever is sooner.

   Examples include a pot of soup that is in a hot-holding cabinet or a half empty pan of hot dog chili that is on the serving line, or pre-portioned cups of cheese placed on the serving line.

3. **Opened containers of commercially prepared foods**–large opened bottles of commercially prepared items such as mustard, ketchup, mayonnaise, salads dressings, pickles, etc. These products should be used by the "use by date" marked on the container.

Shelf-life for Opened Commercially Processed Ingredients Not Subject to the 7-day rule[a,b]

Ingredient	Refrigerated Storage (41°F or colder)
Condiments	
Salsa	3-5 days
Mayonnaise Tartar sauce	2 months
Pickles and olives	2-3 months
Salad dressing (Ranch, Italian)	3 months
Honey Molasses Jams and Jellies Mustard	6-8 months
Catsup	12 months
Dairy Products	
Cottage cheese Ricotta cheese	1 week
Sour cream	2 weeks
Processed cheese American/Cheddar cheese (grated)	1 month
Block hard natural cheese (Cheddar or Swiss)	1-2 months
Butter	1-3 months
Parmesan cheese (grated)	2-3 months
Margarine	4-5 months

a. This is a list of ingredients that are commonly used in the Child Nutrition Program. If you have a specific question about a food that is not on this list, please contact your School Meals Consultant.

b. These ingredients can be refrigerated for more than seven days after opening. However, they must be used before the date that is stamped on the package. If there is no package date, follow the chart above.

Handling pre-prepared foods

Only the foods that are on the pre-prepared list in Binder 1: Recipe and Menus of the HACCP Plan can be frozen for up to four weeks. Pre-prepared foods must be stored in shallow containers so they will freeze quickly. The container must be covered with a lid or appropriate freezer wrap.

All pre-prepared foods must be labeled as:

1. **Pre-prepared NAME OF FOOD**
2. **Amount**
3. **Date and time the item was prepared**

This must be written directly on the freezer wrap or on freezer tape, or adhesive label that is secured to the lid or wrap using a black permanent marker. If a menu item is not on the list and/or the handling procedures are not on the recipe, then the item must be handled as a leftover and used within three days. Furthermore, once an item that is on the list is prepared for service, any remaining portions must be handled as a leftover. For example, cooked ground beef that was prepared and frozen two weeks ago is used to make spaghetti sauce on a Monday. One pan of spaghetti sauce is still in the hot-holding cabinet; this pan must be refrigerated or frozen and used within three days. Just because it is on the list of pre-prepared foods does not mean that it can be frozen again and saved for an additional two weeks.

Handling leftovers

All leftovers–Time/temperature control for safety (TCS) or non-TCS, refrigerated or frozen–*must* be used within three days. This does not include unopened containers of commercially processed foods, such as pretzels, muffins, and milk, that were on the serving line; these types of products should be used by the date stamped on the package. Leftover whole pieces of fresh fruit that are good quality may be saved for service beyond three days as long as it is re-washed before being placed on the serving line.

Furthermore, it is important to remember that not all foods can be saved as a leftover. If the food is TCS (as indicated on the standardized recipe or procedure), then you must check its temperature to be sure that it can be safely saved as a leftover. If the temperature is 135°F or hotter or 41°F or colder, then you can safely save it as a leftover.

All leftovers that have been determined to be safe must be covered and labeled:

1. **Leftover NAME OF FOOD**
2. **Amount**
3. **Date to be used by OR the date of preparation**

The Daily Meal Production Record will include the date of preparation and a use by date.

This information must be written directly on the wrap, tape, or label that is secured to the lid or wrap using a black permanent marker. Also note the amount, the temperature, and the date the item is to be used in section 15 of your Daily Meal Production Plan. If the item is not at a safe temperature, the item must be thrown it out. Note this in section 12 of your Daily Meal Production Plan. The product should be clearly marked with either the *date of preparation* OR a *use by date*, but both dates are NOT required. Merely marking a date on the product is not acceptable. For example, Date Prepared 1/18/12 or Use by 1/21/12 is acceptable.

All leftovers must be used within three days from the date of preparation. If the leftover is TCS and is to be served hot, it must be reheated to 165°F or hotter before serving. If the leftover is TCS and is to be served cold, it must be held at 41°F or colder before serving. Pre-prepared foods and leftovers should be reheated only one time after initially cooking them and then discarded.

What Is the Correct Storage Temperature?

Directions: Record the proper storage temperature (°F) for each food item in the space provided.

_____ Individual cartons of milk

_____ Fresh chicken pieces

_____ Chopped lettuce

_____ Precooked frozen beef patties

_____ Cans of soup

_____ Fresh ground turkey

_____ Liquid pasteurized eggs

_____ Bag of flour

_____ Whole apples

_____ Frozen pizza

_____ Commercially processed brownies

_____ Canned fruit cocktail

_____ Cut bananas

_____ Tuna salad made in-house

What's Wrong?

Directions: In the space below, describe what Janet did wrong.

A shipment was delivered to Hilltop Elementary in early May. Janet, who was in charge of receiving, inspected the shipment and immediately began storing the items. She loaded a case of sour cream on the dolly and wheeled it over to the reach-in refrigerator. When she opened the refrigerator, she noticed that it was full; however, she did find a place for the sour cream on the top shelf next to several packages of fresh ground beef.

Next, she put several cases of fresh ground turkey in the walk-in refrigerator. She noticed that the temperature on the outside of the walk-in was 39°F. As Janet moved inside, she bumped into a hot stockpot of chili that was on the floor. She moved the chili over and made a space on the floor next to the door for the ground turkey.

Janet returned to the receiving area and loaded several cases of pasta on the dolly. She stacked the boxes on shelves in the dry storeroom and gave a quick glance at the thermometer in the dry storage room, which was 90°F. When she was finished stacking the boxes, Janet returned the dolly to the receiving area.

Organize this Refrigerator

Directions: Organize your refrigerator so that each food is protected from cross-contamination. To help you do so, identify which of the following foods are "RAW" or ready-to-eat "RTE." Then organize all foods in the refrigerator.

_____ Ground turkey

_____ Chopped lettuce

_____ Shell eggs

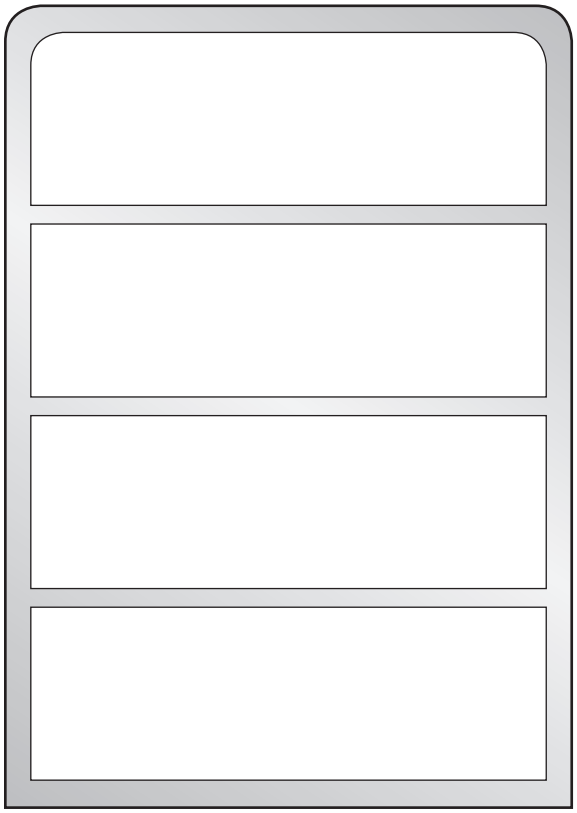
_____ Leftover spaghetti and meat sauce

_____ Fresh tomatoes

_____ Tuna salad

_____ American cheese slices

_____ Raw chicken pieces



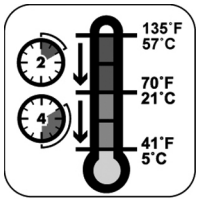
APPLICATION EXERCISES

Test Your Knowledge–True or False

T	**F**	You must store deliveries immediately after you have inspected them.
T	**F**	You must check the temperatures of all refrigerators each day.
T	**F**	You must store foods that are the oldest in the front and the newer foods in the back.
T	**F**	Leftover chili must be used within four days.
T	**F**	Bread that was prepared on January 6 and that is frozen must be used before February 6.
T	**F**	All produce must be washed before storage.
T	**F**	Freezer temperatures need to be checked at least once per week.
T	**F**	You can store cleaning supplies with food as long as the container is properly labeled.
T	**F**	Foods must be stored at least six inches above the floor.
T	**F**	Raw meat must always be stored below cooked or ready-to-eat food.
T	**F**	Unopened cartons of milk that are on the serving line at the end of the day must be used by the date that is stamped in the package.

Notes

Thermometers



Another major cause of foodborne illness is temperature abuse of Time/temperature control for safety foods. Time/temperature control for safety (TCS) foods are low acid, moist, and contain some protein. Temperature abuse occurs when a TCS food is between 41°F and 135°F for four hours or longer. The temperature range between 41°F and 135°F is called the temperature danger zone. When food is in this temperature range, harmful bacteria can grow, multiply, and possibly cause foodborne illness.

To prevent temperature abuse, minimize the time that TCS food is in the temperature danger zone by:

- Checking the temperature of TCS food during storage, after cooking, when removed from hot holding and at the end of serving including leftovers that will be discarded. Record end cooking temperature, holding temperature, and leftover temperature on the daily production record.
- Checking the temperature of refrigerators, freezers, and hot-holding cabinets every morning.
- Recording temperature observations on the appropriate monitoring form.
- Following the corrective actions outlined in your HACCP binder Section 2-7: Corrective Actions when temperature standards are not met.

Calibration

The only way to properly check temperatures is to use an accurate thermometer.

Check the accuracy of all food thermometers:

- **At least once a day**
- **Every time a thermometer is dropped**
- **After it has been exposed to extreme temperatures**

You can use one of two methods to check the accuracy of your food thermometers. The most commonly used method is the ice-point method. Immerse the stem of the thermometer in a container of crushed ice and cold water and wait about 30 seconds. The thermometer should read 32°F at sea level (adjust based on altitude). If it does not, it needs to be adjusted. The second method uses boiling water. Boil water and then immerse the stem of the thermometer in the water. Be very careful when using this method so that you do not burn yourself. The reading should be 212°F at sea level (adjust based on altitude). If it does not, then adjust the thermometer so that it does.

APPLICATION EXERCISES

What's Wrong?

Directions: In the space below, describe what Samantha did wrong.

Samantha is responsible for checking the accuracy of the five metal-stem thermometers that are used to check food temperatures. She gets all of the metal-stem thermometers from their storage location. She then gets a large drinking cup and fills it with ice cubes and then cold water. She lets it get cold. She then puts all of the thermometers into the ice water. Three of the thermometers were at 32°F. Two were not. Samantha records on the Daily Production Plan that she has checked the accuracy of the thermometers. She puts the thermometers back into their storage place so that they can be used later in the day.

Test Your Knowledge–True or False

T	**F**	If measuring the temperature of ready-to-eat foods, clean but do not sanitize the probe or stem of the thermometer between each use.
T	**F**	Food is in the temperature danger zone when it is between 41°F and 145°F.
T	**F**	Check the accuracy of all food thermometers each day before they are used.
T	**F**	The correct reading of a thermometer must be 45°F when using the ice-point method to calibrate a thermometer.
T	**F**	To accurately check the temperature, fill a container with crushed ice and then cold water. Insert the thermometer probe into the container and then check the temperature.

Preparation

Three things to remember when preparing food–prevent cross-contamination, prevent temperature-abuse, and practice good personal hygiene.

Prevent cross-contamination by:

- Washing hands properly before working with food and after touching raw meat, poultry, or seafood.
- Using different cutting boards and utensils to keep raw and ready-to-eat food separate.
- Cleaning and sanitizing all work surfaces and equipment after each task, especially after working with raw food.
- Preparing raw and ready-to-eat food items in separate areas of the kitchen, if possible.

Prevent time-temperature abuse.

Harmful microorganisms grow and multiply at temperatures between 41°F and 135°F (the temperature danger zone).

Minimize the amount of time food is in the temperature danger zone by:

- Removing only enough food from the refrigerator that can be prepared in one hour.
- Refrigerating food if interrupted during preparation.
- Refrigerating or cooking food as soon as preparation is complete.

Practice good personal hygiene.

Washing hands frequently and properly during food preparation is important. Keeping clothes clean and nails clean and short is also important. And never work with food if you are sick.

Thawing frozen foods

Freezing does not kill microorganisms, but it does slow their growth. When frozen food is thawed, the outer surface might warm up enough to allow harmful microorganisms to grow. Because it can take more than four hours to thaw most foods, thaw food:

- **In a refrigerator at 41°F or colder**–plan ahead when thawing large items such as turkey (they can take three to four days to thaw).
- **Under cool running water**–the water flow must be strong enough to wash food particles into the sink drain.
- **In a microwave oven if the food will be cooked immediately**–large items, such as roasts or turkeys, might not thaw well in a microwave oven.
- **As part of cooking**–when cooking frozen hamburger patties, the hamburgers are thawed and then cooked to a minimum internal temperature of 155°F for 15 seconds all in one step.

Cooking temperatures

After safely preparing food, cook it to the correct temperature to kill harmful microorganisms. Always use a thermometer to verify final cooking temperatures.

Cooking Temperatures for Several Food Items

Food	Minimum Internal Temperature
Poultry	**165°F**
Stuffing and stuffed meat	**165°F**
Dishes that include TCS ingredients	**165°F**
Ground meats (including beef, pork, and other meat or fish)	**155°F**
Injected meats (including brined ham and flavor-injected roasts)	**155°F**
Pork, beef, veal, and lamb	**145°F for steaks/chops** **155°F for roasts**
Fish, whole or fillets Stuffed fish (or stuffing containing fish) Ground, chopped, or minced fish	**145°F** **165°F** **155°F**
Shell eggs for immediate service Shell eggs that will be hot-held	**145°F** **155°F**
Fruits or vegetables that will be hot-held	**135°F**
Commercially processed, ready-to-eat food that will be hot-held or refer to manufacturer's directions	**135°F**
TCS food cooked in a microwave oven	**165°F**

When cooking in a microwave oven:

- Cover food to prevent drying.
- Cook food to 165°F.
- Rotate or stir food halfway through cooking.
- Take food's temperature and let stand for two minutes after cooking.

Other preparation tips

- Leave all ingredients in the refrigerator until they are ready to be mixed.
- Prepare salads in small batches to prevent time-temperature abuse.
- Cook eggs that are cracked open and combined in a bowl right after mixing.
- Prepare batter in small batches and immediately refrigerate what is not used at 41°F or colder.
- Never use the same container of batter or breading for more than one product. Throw away any unused batter and breading.
- Prepare fruit and vegetables away from raw meat, poultry, seafood, and eggs. Wash fruit and vegetables in a colander under cool running water before cutting, cooking, or combining them with other ingredients. Refrigerate all cut fruits and vegetables.

Cooling and reheating food

Cooling and reheating are important steps in the preparation of food. During cooling, minimize the time food is in the temperature danger zone by using one of the four cooling methods described below. Record the cooling times and temperatures on the cooling log; refer to Section 2-6: Monitoring for the form and instructions. When reheating food, make sure it quickly reaches a safe temperature. Before cooling food, reduce the quantity or size of the food by dividing large food items into smaller portions.

Four methods for cooling food:

- Place food in an ice-water bath and stir frequently. Once cooled, pour food into a pan, loosely cover, and refrigerate.
- Place tightly packaged food in a blast chiller or tumble chiller.
- Cut large pieces of meat into smaller pieces before refrigerating.
- Put food in a pan at a depth of no more than two inches, loosely cover, and refrigerate.

When reheating food:

- Reheat previously cooked, TCS food to 165°F or hotter for fifteen seconds within two hours. If the food has not reached that temperature within two hours, throw it out.
- Never reheat foods more than one time.

Let's Get Cooking

Directions: Record the safe cooking temperature (°F) for each food item.

_____ Raw beef patties

_____ Fish sticks

_____ Chili with ground beef

_____ Toasted cheese sandwich

_____ Spaghetti with meatballs

_____ Frozen pizza

_____ Green beans

What's Wrong?

Directions: In the space below, describe what did Sharonda did wrong.

At 12:30 p.m., Sharonda checked the temperature of a pan of spaghetti with meat sauce that had been on the serving line. It was at 140°F. She loosely covered it before putting it into the refrigerator. At 2:45 p.m., she checked the temperature and found that the pan of spaghetti with meat sauce was at 86°F. The next day, Sharonda pulled out the pan of spaghetti and reheated it to 165°F before putting it onto the serving line.

What's Wrong?

Directions: In the space below, describe what Ann did wrong.

Ann is responsible for taking the temperature of all foods before they are put on the serving line. Lasagna is being served that day. At 10:30 a.m. before she removes the lasagna from the oven, she checks its temperature using an oven thermometer. The reading is over 150°F, so Ann pulls it out of the oven and puts it into a hot cabinet. She notes 150°F on the daily production sheet. At 11:00 a.m. she checks the temperature of the lasagna with a metal-stemmed thermometer before putting it on the serving line. It is at 132°F. Ann figures that only thirty minutes has passed, so she puts the lasagna on the serving line.

Test Your Knowledge–True or False

T	**F**	Cook turkey to 155°F or hotter for fifteen seconds to make it safe to eat.
T	**F**	Cook beef hamburger patties to 145°F or hotter for fifteen seconds to make them safe to eat.
T	**F**	Cutting meat into small pieces is one way to cool it properly.
T	**F**	Immersing frozen food under warm running water is a safe way to thaw food.
T	**F**	Bacteria multiply most rapidly at room temperature.
T	**F**	Leftover casseroles should be reheated to at least 130°F.
T	**F**	Tightly cover all foods that are being cooled before putting them in the refrigerator.

Service

Food must be handled safely not only before it is served, but also while it is being served. Therefore, equipment used to keep foods hot or cold before and during serving must be properly maintained.

Hot-holding food

- Hold TCS food at 135°F or hotter.
- Only use hot-holding equipment that keeps food at 135°F or hotter.
- Never use hot-holding equipment to reheat food.
- Check food temperatures with a thermometer before foods are placed on the serving line.
- Protect food from contaminants with covers or sneeze guards.
- Prepare food in small batches so food is not held for long periods of time.

Cold-holding food

- Hold cold food that is TCS food at 41°F or colder.
- Only use cold-holding equipment that can keep food at 41°F or colder.
- Do not store food items directly on ice.
- Check food temperatures with a thermometer before foods are placed on the serving line.
- Protect food from contaminants with covers or sneeze guards.
- Prepare food in small batches so food is not held for long periods of time.

Child nutrition employees

- Store serving utensils in the food with the handle extended above the container rim, on a clean, sanitized food-contact surface, or under cold running water.
- Use cleaned and sanitized utensils with long handles to serve food.
- Minimize bare-hand contact with food that is cooked or ready-to-eat.
- Practice good personal hygiene, such as wearing clean clothes and hair restraints and washing hands frequently and properly.
- Do not touch food-contact areas of plates, bowls, glasses, or cups.
- Do not stack glassware and dishes when serving.
- Store flatware and utensils so handles will be touched and not food-contact surfaces.
- Minimize bare-hand contact with food that is cooked or ready-to-eat.
- Use ice scoops or tongs to get ice.

Self-service areas

- Protect food on display with sneeze guards or food shields.
- Label containers on the food bar. Label handles with the name of salad dressings.
- Keep hot food at 135°F or hotter and cold food at 41°F or colder.
- Replenish food on a timely basis.
- Separate raw meat, fish, and poultry from cooked and ready-to-eat food.
- Do not let customers use soiled plates or silverware for refills.

Re-serving food

Once a food touches the student's tray, it has been served. Once served, most foods cannot be re-served to anybody.

The only foods that can be re-served are commercially packaged foods, such as:

- **Cookies**
- **Cartons of milk**
- **Ice cream bars**
- **Bags of chips or pretzels**
- **Juice boxes**

For example, if the student is going through the serving line and puts a commercially packaged food on his or her tray and discovers that they cannot pay for it, it can be recovered by the cashier and re-served. However, if the student pays for the item, leaves the serving line, and then wants to return the item, the item cannot be recovered and re-served.

Some types of food do not have to be used within three days after placement on a serving line. Commercially processed foods that are in unopened packages that have been on a serving line or that have been displayed in a refrigerated case, such as a milk box, do not have to be used within three days. The three-day rule applies to foods that were prepared in-house, such as fruit salad or lasagna, as well as to opened packages of commercially processed food, such as a 24-pack of muffins. Remember though, if the package is damaged in any way, the food cannot be re-served. Also, if the food is TCS and it has been at unsafe temperatures then it also must be thrown out.

To Re-serve or Not to Re-serve?

Directions: Which of the following foods can be safely re-served?

Yes	**No**	Ice cream bar sold to a student but then returned to the cashier after leaving the serving line.
Yes	**No**	Carton of milk served to an elementary school child who says that they do not want it before leaving the serving line.
Yes	**No**	Bag of chips that a student puts on his tray but has no money to pay for it so gives it back to the cashier before leaving the serving line.
Yes	**No**	Uncovered bowl of salad that a student put on the tray but decides they do not want it when they get to the cashier.
Yes	**No**	Bag of pretzels that a student bought but returned to the cashier cashier after leaving the serving line.
Yes	**No**	Brownies baked in the operation that a student buys but then wants to return to the cashier in exchange for cookies.

What's Wrong?

Directions: In the space below, describe what Mary and Sharon did wrong.

Mary and Sharon are working the serving line at Haysbrook Middle School. Mary is responsible for the cash register and Sharon for serving food. Two students came through the line and Sharon gave them the meal of the day–baked chicken, mashed potatoes, and green beans. One of the students decided that he did not want it and wanted a hamburger instead so he gave his food back to Sharon. She took it and served it to the student who was behind him. At the cash register, one student decided that he did not want the chips that he put on his tray and Mary let him return the chips. Later on a student came back up to Mary and said that they were not going to drink their milk so that she could give it to somebody else. Mary took it and threw it out.

Test Your Knowledge–True or False

T	**F**	If food is not held at the proper temperature, those who eat it could get sick.
T	**F**	Food held at room temperature is considered to be in the temperature danger zone.
T	**F**	A intact bag of chips that a student puts on their tray can be returned if they have not passed the cashier
T	**F**	Once milk is served and the student goes to the dining area, it cannot be returned to the cashier or collected for service to others.
T	**F**	Tongs or hands can be used to dispense ice.

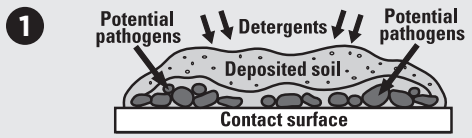
Notes

Sanitation

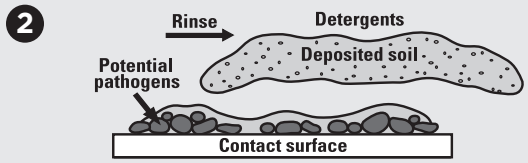
Cleaning and sanitizing is a part of your food safety program. Improperly cleaned and sanitized surfaces allow harmful microorganisms to be transferred from one food to other foods.

- **Cleaning**–removing dirt from surfaces. To do so, one uses a cleaning agent, such as solvent cleaners, acid cleaners, and abrasive cleaners.
- **Sanitizing**–reducing harmful microorganisms that are on a properly cleaned surface to a safe level. Sanitizing agents only work when the surface has been properly cleaned and rinsed.

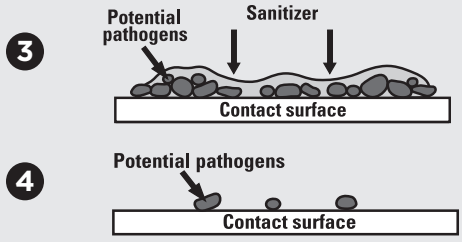
How the cleaning and sanitizing process works



Washing helps loosen soils and other organic material from the surface. **Detergent and scrubbing** also help break the adhesion of microorganisms to the surface.



Rinsing removes loosened soil and detergent from the surface. This step is important because organic material and detergent can bind up sanitizer making it less effective.



Applying the **sanitizer** to clean surfaces actually provides a "kill" step for reducing the number of microorganisms. The surface is not completely free of microorganisms, but the number is greatly reduced, and if done correctly, will result in a safer product without quality damage.

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Two types of sanitizing methods are commonly used:

- **Heat**–using hot water that is between 170°F and 180°F or
- **Chemical solutions**–chlorine at 50 ppm in water, quaternary ammonia at 200 ppm, or iodine at 12.5 ppm

Cleaning and sanitizing can be done in a three-compartment sink or in a dish machine.

In a three-compartment sink, four steps must be followed:

1. **Wash**–water temperature at least 110°F.
2. **Rinse**–water temperature at least 110°F.
3. **Sanitize**–hot water temperature of 171°F or approved chemical solution of proper concentration. Always follow the manufacturer's directions for preparing sanitizing solutions, including the temperature of the water.
4. **Air-dry**–never hand dry.

Dish machines can also be used to clean and sanitize items. A high-temperature dish machine uses hot water to sanitize dishes. The final rinse temperature must be at least 180°F. The temperature of the water must be measured at the manifold every day before the first load of dishes is washed. The water pressure must also be measured with a chemical sanitizing machine, the final rinse water must be between 75°F and 120°F. Record the pressure and the temperature or the concentration of the final rinse on the daily operations log found in Section 2-6: Monitoring.

Measuring sanitizing concentration

A test kit that accurately measures the concentration of sanitizing solutions must also be available and used. The strength of sanitizing solutions must be measured frequently. Use the test strips provided for the specific type of chemical used.

Food-contact surfaces

A food-contact surface is a surface food touches. *Examples include: utensils, cutting boards, slicers, countertops, storage bins, baking sheets, and refrigerator shelves*. Food-contact surfaces must be cleaned and sanitized.

If you cannot clean and sanitize the item in a three-compartment sink or in the dish machine, then you will need to clean in-place. Wash, rinse, spray with a properly prepared sanitizing solution, and air dry.

Store cleaned and sanitized items in a clean, dry location that is not exposed to splash, dust, or other contamination at least six inches above the floor in a self-draining position covered or inverted.

Material Safety Data Sheets (MSDS)

Occupational Safety and Health Administration (OSHA) requires an MSDS for all hazardous chemicals used in the operation. The MSDS lets you know about the chemicals that you are using. It also gives you information about how to properly store and handle these chemicals.

It is recommended to highlight the name of the chemical and the first aid procedures on the MSDS for quick reference in an emergency.

On every MSDS, be familiar with the following sections:

4.0 Fire and explosion data
5.0 Reactivity data
6.0 Spill or leak procedures
7.0 Health hazard data
8.0 First aid
9.0 Protective measures
10.0 Additional information/precautions

Food Contact Surface or Not?

Directions: Identify items that are food-contact surfaces "**FCS**" and place an "**X**" next to items that are non-food contact surfaces "non-FCS". FCS items need to be both cleaned and sanitized.

_____ Stockpots

_____ Plates

_____ Cutting boards

_____ Walls

_____ Forks

_____ Floors

_____ Gaskets on the refrigerator

_____ Trashcans

_____ Tables in the dining area

_____ Base of the mixer

_____ Baking sheets

What's Wrong?

Directions: In the space below, describe what Sarah did wrong.

Sarah is cutting up raw chicken before cooking them today for lunch. After finishing, she rinses the knife in the hand sink and dries it with a dishtowel. Sarah's manager tells her that Sue is not coming in because she is sick so she will have to chop up lettuce for salads. Sarah takes the knife she used with the chicken, dips it into a sanitizing solution and then uses it to chop lettuce for salads. While making salads, the manager tells Sarah that the chicken needs to be cut into small pieces so she stops chopping lettuce and cubes the chicken. After finishing, she returns to chopping the lettuce for the day.

Test Your Knowledge–True or False

T	**F**	Surfaces must be sanitized before they can be cleaned.
T	**F**	Cleaning reduces the number of microorganisms on a surface to a safe level.
T	**F**	The exterior of a refrigerator is a non-food contact surface so it needs to be cleaned but not sanitized.
T	**F**	A chlorine sanitizing solution must be at least 100 ppm to be safe to use.
T	**F**	After cleaning and sanitizing items, dry with a clean cloth.
T	**F**	Use a test kit to check the concentration of chemical sanitizer in a three-compartment sink.
T	**F**	Material Safety Data Sheets (MSDS) provide information about hazardous chemicals.
T	**F**	A slicer is a food-contact surface, so it must be cleaned and sanitized.

Notes

Integrated Pest Management

Pests, such as insects and rodents, can contaminate food supplies as well as damage your facilities. More importantly, they can also contribute to foodborne illness and other diseases. Pesticides are often used to control pests but pesticides alone are not the solution. A better solution is to have an integrated pest management program (IPM) as part of your food safety program. IPM minimizes reliance on chemical pesticides. The two basic rules of an IPM program are to deny pests food and shelter and to work with a licensed pest management professional (PMP).

Denying pests food and shelter

Garbage is a breeding place for harmful microorganisms and insects and can serve as food for rodents. Ideally, at least one garbage can in each work area should have a lid. The lid does not have to be on a garbage can while it is in use. Constantly taking off a lid and putting it back on is not a sanitary practice, so wash hands each time this takes place. Therefore, it is best to keep the lids off of the can while it is in use. Garbage cans are considered to be in use when food is being prepared. For most school cafeterias, garbage cans will be viewed as in use during all hours that the operation is open.

To prevent other problems associated with garbage and trash:

- Use plastic liners for garbage cans to make it easier to keep clean.
- Wash garbage cans daily inside and out with warm, soapy water. Allow them to drain and dry.
- Keep areas surrounding garbage cans clean as possible.
- Use rodent traps in and near the garbage areas.
- Throw out garbage frequently and properly.
- Store recyclables in clean, pest-proof containers.
- Keep the dumpster and dumpster pad area cleaned.
- Make sure dumpster drains are plugged.
- Keep floors drains clean and free of debris.

General

- Eliminate conditions that allow pests to live and breed.
- Use trapping devices or other means of pest control.
- Keep work and dining areas free from debris.
- Clean compressor motors, such as those on refrigerators and freezers, as they are prime areas for roaches because they have ideal temperatures for breeding.
- Do not store foods longer than their recommended time.

Storage

- Store all food and supplies at least six inches above the floor.
- Cover food.
- Clean up spilled foods immediately.
- Clean storage areas thoroughly.
- Remove foods, such as flour, sugar, pancake mix, from their original containers and put in properly labeled, food-grade containers that have a tight lid.
- Inspect storage areas routinely. Look for rodent or cockroach droppings or other evidence of pest activity.

Pests associated with stored food

These pests can include moths and beetles that feed on and contaminate stored grain products, such as flour and rice, as well as processed foods such as cereals and baked goods. Again, the best control is prevention. Inspect all incoming items for the presence of pests, throw away and clean up all spilled or contaminated items promptly, and keep the grounds clean. Use FIFO as a storage method as old stock is more likely to become infested. Adequate ventilation is necessary to reduce moisture levels. While prevention is the best control measure, existing infestations are best treated by discarding infested items, cleaning up the area and notifying a trained PMP of the issue.

Using and storing pesticides

- Keep pesticides in their original containers. Never store pesticides in old food containers.
- Never apply pesticides where food is being prepared and/or served.
- Store pesticides in locked cabinets away from areas where food is stored and prepared.
- Check with your local Cooperative Extension or state regulatory agencies about the proper method for disposing of old or excess pesticides.
- Keep a copy of the corresponding product labels and Material Safety Data Sheets in your establishment.
- Keep records of any pesticides applied in your facility.

APPLICATION EXERCISES

What's Wrong?

Directions: Describe what Ken did wrong.

Ken opened up the kitchen on Monday and noticed what looked like mouse droppings in the storeroom. He also noticed a few cockroaches near the garbage can, which was not removed for the weekend. Ken calls maintenance to have them put in mouse traps but decides to treat the cockroaches himself. He takes a can of Raid and sprays it all over the garbage can and in the area.

_____

_____

_____

_____

Directions: Describe what likely caused this problem. How should it be corrected? How can Ken prevent it from occurring again?

While Ken was taking inventory of supplies in the storeroom, he finds beetles crawling on the floor near one storage rack. He traces them back to nearby bags of flour stacked of the floor. The two bottom bags have holes and they heavily infested with beetles.

_____

_____

_____

_____

Test Your Knowledge–True or False

T **F** Food items such as flour should be stored in their original containers.

T **F** Garbage cans in work areas should have their lids on at all times during work hours.

T **F** Never store pesticides in anything other than their original containers.

T **F** The best control for stored food pests is monthly spraying of storage areas.

T **F** Bags of flour and rice that are passed their expiration date should be mixed with new stocks when they arrive.

NC STATE UNIVERSITY





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